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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/629,614	07/30/2003	Won-Youl Choi	277/006	6106
7590	09/09/2005		EXAMINER	
LEE & STERBA, P.C. Suite 2000 1101 Wilson Boulevard Arlington, VA 22209			SCHINDLER, DAVID M	
			ART UNIT	PAPER NUMBER
			2862	

DATE MAILED: 09/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>
	10/629,614	CHOI ET AL.
	<b>Examiner</b>	<b>Art Unit</b>
	David Schindler	2862

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 22 July 2005.
- 2a) This action is FINAL.                    2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-64 is/are pending in the application.
  - 4a) Of the above claim(s) 32-64 is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1-31 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 7/30/2003 is/are: a) accepted or b) objected to by the Examiner.
 

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) All    b) Some \* c) None of:
    1. Certified copies of the priority documents have been received.
    2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

Bot Ledynh  
Primary Examiner

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____.   |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>6/20/2005</u> . | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
|  | 6) <input type="checkbox"/> Other: _____.                                   |

## DETAILED ACTION

1. This action is in response to the communication on 7/22/2005.

### *Election/Restrictions*

2. Claims 32-64 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 7/22/2005.

### *Drawings*

3. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the external circuit of claim 1 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New

Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Objections***

4. Claims 1-31 are objected to because of the following informalities:

As to Claim 1,

The phrase "a pad for establishing conductivity between the first and second excitation coils and the first and second pick-up coils and an external circuit" as stated on the last two lines is unclear. The phrase is unclear as it is not clear what the pad is establishing conductivity between.

As to Claims 2-31,

The difference between the two parallel bars in conjunction with the various excitation or pick-up coils that are wound around the bars is unclear. That is, for example, the phrase "the first and second soft magnetic cores comprise two parallel bars on a same plane" in lines 1-3 of claim 2 is unclear. It is not clear if the first and second magnetic cores each comprise two parallel bars, or if each parallel bar is one of the cores. Furthermore, the claims that pertain to the various winding patterns around the cores are unclear. For example, claim 3 states "the first and second excitation coils have a structure of winding the two bars substantially in a solenoid pattern" on lines 1-3. This phrase is unclear as it is not clear if the first excitation coil winds the two bars of a first soft magnetic core, or if it winds both cores. The same goes for the second

excitation coil. The above issues appear throughout the claims in both the above mentioned two parallel bars and with the rectangular-ring claims.

Appropriate correction is required.

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1, 2, 5, and 6 are rejected under 35 U.S.C. 102(e) as being anticipated by Kang et al. (herein referred to as "Kang") (2003/0169037)

The applied reference has a common inventor and assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

As to Claim 1,

Kang discloses a first soft magnetic core (1) formed lengthwise in a first axial direction; a first excitation coil ((2) in combination with (3)) formed of a metal film and wound around the first soft magnetic core; a first pick-up coil ((4) in combination with (5)) formed of a metal film and wound around the first soft magnetic core and the first excitation coil; a second soft magnetic core (1') formed lengthwise in a second axial direction, the second axial direction being perpendicular to the first axial direction; a second excitation coil ((2') in combination with (3')) formed of a metal film and wound around the second soft magnetic core; a second pick-up coil ((4') in combination with (5')) formed of a metal film and wound around the second soft magnetic core and the second excitation coil; and a pad for establishing conductivity between the first and second excitation coils and the first and second pick-up coils and an external circuit ((Figures 1 and 2) and (Page 2, Paragraphs [0027-0031]) and (Page 3, Paragraph [0032]) and (Page 3, Paragraph [0037] / note permalloy on line 13)).

It is noted to applicant that Kang does not explicitly disclose a pad for establishing conductivity between the first and second excitation coils and the first and second pick-up coils and an external circuit. However, Kang must include an electrical contact pad for the coils to be able to connect to an external device as Kang clearly intends for the device to be connected to an external device (Page 4, Paragraph [0051]).

As to Claim 2,

Kang discloses the first and second soft magnetic cores include two parallel bars on a same plane (Figure 1).

As to Claim 5,

Kang discloses the first and second excitation coils and the first and second pick-up coils wind the two bars in an alternating fashion (Figure 1).

As to Claim 6,

Kang discloses the first and second excitation coils and the first and second pick-up coils are wound once substantially in a zigzag fashion, such that the first and second excitation coils and the first and second pick-up coils face each other with the intervention of the two bars therebetween ((Figure1) and (Page 2, Paragraph [0030]).

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1, 2, 3, 4, 5, 7, 8, 9, 17, 18, 19, 20, 22, and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fedeli et al. (6,690,164) embodiment one (FE1) in view of Fedeli et al. (6,690,164) embodiment two (FE2) and Glowacki et al. (herein referred to as "Glowacki") (6,251,834).

As to Claim 1,

FE1 discloses a first soft magnetic core ((10a) in combination with (10b)) formed lengthwise in a first axial direction; a first excitation coil (12) formed of a metal film and wound around the first soft magnetic core; a first pick-up coil (14) formed of a

metal film and wound around the first soft magnetic core and the first excitation coil; a second soft magnetic core formed lengthwise in a second axial direction, the second axial direction being perpendicular to the first axial direction; a second excitation coil formed of a metal film and wound around the second soft magnetic core; a second pick-up coil formed of a metal film and wound around the second soft magnetic core and the second excitation coil; and a pad for establishing conductivity between the first and second excitation coils and the first and second pick-up coils and an external circuit ((Figures 1A and 1B) and (Column 1, Lines 66-67) and (Column 2, Lines 1-32)).

FE1 does not explicitly disclose that the cores are soft magnetic cores.

FE2 discloses the a soft magnetic core (FeNi) (Column 3, Line 7)

Glowacki discloses Feni has a greater tensile strength (Column 3, Lines 13-16).

It would have been obvious to a person of ordinary skill in the art to modify FE1 to include the cores are soft magnetic cores given the above disclosure and teaching of FE2 and Glowacki in order to have a core of greater tensile strength. This soft magnetic core teaching is applied to all claim rejections.

It is noted that the pick-up coil shown in Figure 1A is wound around a side of the excitation coil. It is further noted that while FE1 does not explicitly disclose an external circuit connected to the pads, the purpose of using pads is to connect the device to an external circuit and therefore there must indeed be an external circuit connected to the device.

As to Claim 2,

FE1 discloses the first and second cores include two parallel bars on a same plane ((Figures 1A and 1B) and (Column 2, Lines 15-32)).

As to Claim 3,

FE1 discloses the first and second excitation coils have a structure of winding the two bars substantially in a solenoid pattern ((Figures 1A and 1B) and (Column 2, Lines 15-32)).

As to Claim 4,

FE1 discloses the first and second pick-up coils have a structure of winding the two bars together substantially in a solenoid pattern ((Figures 1A and 1B) and (Column 2, Lines 15-32)).

As to Claim 5,

FE1 discloses the first and second excitation coils and the first and second pick-up coils wind the two bars in an alternating fashion ((Figure 1A) and (Column 2, Lines 15-32)).

\*Note the double excitation coil (12) in Figure 1A and that the pick-up coil (14) is in between the double excitation coil. This reasoning applies to all claim rejections.

As to Claim 7,

FE1 discloses the first and second pick-up coils have a structure of winding the two bars substantially in a solenoid pattern ((Figures 1A and 1B) and (Column 2, Lines 15-32)).

As to Claim 8,

FE1 discloses the first and second excitation coils and the first and second pick-up coils wind the two bars in an alternating fashion ((Figures 1A and 1B) and (Column 2, Lines 15-32)).

As to Claim 17,

FE1 discloses the first and second magnetic cores include a rectangular-ring formed on a same plane ((Figures 1A and 1B) and (Column 2, Lines 15-32)).

As to Claim 18,

FE1 discloses the first and second excitation coils have a structure of winding both sides of the rectangular-ring in an axial direction substantially in a solenoid pattern ((Figures 1A and 1B) and (Column 2, Lines 15-32)).

As to Claim 19,

FE1 discloses the first and second pick-up coils have a structure of winding both sides of the rectangular-ring in an axial direction together substantially in a solenoid pattern ((Figures 1A and 1B) and (Column 2, Lines 15-32)).

As to Claim 20,

FE1 discloses the first and second excitation coils and the first and second pick-up coils have a structure of winding the rectangular-ring in an alternating fashion ((Figures 1A and 1B) and (Column 2, Lines 15-32)).

As to Claim 22,

FE1 discloses the first and second pick-up coils have a structure of winding both sides of the rectangular-ring substantially in a solenoid pattern ((Figure 1A) and (Column 2, Lines 15-32)).

As to Claim 23,

FE1 discloses the first and second excitation coils and the first and second pick-up coils have a structure of winding the rectangular-ring in an alternating fashion ((Figures 1A and 1B) and (Column 2, Lines 15-32)).

9. Claims 6, 9, 10, 11, 12, 13, 14, 15, 16, 21, and 24-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fedeli et al. (6,690,164) embodiment one (FE1) in view of Fedeli et al. (6,690,164) embodiment two (FE2) and Glowacki et al. (herein referred to as "Glowacki") (6,251,834) and in further view of Choi et al. (herein referred to as "Choi") (6,411,086) and Wong (6,100,694).

As to Claims 6 and 9,

FE1 in view of FE2 and Glowacki discloses as explained above.

FE1 discloses the first and second excitation coils and the first and second pick-up coils face each other with the intervention of the two bars therebetween ((Figure 1A) and (Column 2, Lines 15-32)).

FE1 in view of FE2 and Glowacki does not disclose the first and second excitation coils and the first and second pick-up coils are wound once substantially in a zigzag fashion.

Choi discloses an excitation in a zigzag fashion (Figure 4).

Wong discloses an advantage of zig-zag meander line patterns is that they can be easily manufactured to precision by machining or etching using standard circuit board technology ((Column 7, Lines 65-67) and (Column 8, Line 1)).

It would have been obvious to a person of ordinary skill in the art to modify FE1 in view of FE2 and Glowacki to include the first and second excitation coils and the first and second pick-up coils are wound once substantially in a zigzag fashion given the above disclosure and teaching of Choi and Wong in order to be able to easily manufacture the zigzags to precision by using standard circuit board technology.

As to Claim 10,

FE1 in view of FE2 and Glowacki does not disclose the first and second excitation coils have a structure of winding the two bars alternately substantially in a figure-eight pattern.

Choi discloses winding an excitation coil in a figure-eight pattern (Column 4, Lines 38-55).

It would have been obvious to a person of ordinary skill in the art to modify FE1 in view of FE2 and Glowacki to include the first and second excitation coils have a structure of winding the two bars alternately substantially in a figure-eight pattern given the above disclosure and teaching of Choi in order to have magnetic fluxes generated by alternating excitation currents that are opposite to each other (Column 3, Lines 40-43).

As to Claim 11,

FE1 discloses the first and second pick-up coils have a structure of winding the two bars together in a solenoid pattern ((Figures 1A and 1B) and (Column 2, Lines 15-32)).

As to Claim 12,

FE1 discloses the first and second excitation coils and the first and second pick-up coils have a structure of winding the two bars in an alternating fashion ((Figure 1A) and (Column 2, Lines 15-32)).

As to Claim 13,

FE1 in view of FE2 and Glowacki discloses as explained above.

FE1 discloses the first and second excitation coils and the first and second pick-up coils face each other with the intervention of the two bars therebetween ((Figure 1A) and (Column 2, Lines 15-32)).

FE1 in view of FE2 and Glowacki does not disclose the first and second excitation coils and the first and second pick-up coils are wound once substantially in a zigzag fashion.

Choi discloses an excitation in a zigzag fashion (Figure 4).

Wong discloses an advantage of zig-zag meander line patterns is that they can be easily manufactured to precision by machining or etching using standard circuit board technology ((Column 7, Lines 65-67) and (Column 8, Line 1)).

It would have been obvious to a person of ordinary skill in the art to modify FE1 in view of FE2 and Glowacki to include the first and second excitation coils and the first and second pick-up coils are wound once substantially in a zigzag fashion given the above disclosure and teaching of Choi and Wong in order to be able to easily manufacture the zigzags to precision by using standard circuit board technology.

As to Claim 14,

FE1 discloses the first and second pick-up coils have a structure of winding the two bars substantially in a solenoid pattern ((Figures 1A and 1B) and (Column 2, Lines 15-32)).

As to Claim 15,

FE1 discloses the first and second excitation coils and the first and second pick-up coils have a structure of winding the two bars in an alternating fashion ((Figure 1A) and (Column 2, Lines 15-32)).

As to Claims 16,

FE1 in view of FE2 and Glowacki discloses as explained above.

FE1 discloses the first and second excitation coils and the first and second pick-up coils face each other with the intervention of the two bars therebetween ((Figure 1A) and (Column 2, Lines 15-32)).

FE1 in view of FE2 and Glowacki does not disclose the first and second excitation coils and the first and second pick-up coils are wound once substantially in a zigzag fashion.

Choi discloses an excitation in a zigzag fashion (Figure 4).

Wong discloses an advantage of zig-zag meander line patterns is that they can be easily manufactured to precision by machining or etching using standard circuit board technology ((Column 7, Lines 65-67) and (Column 8, Line 1)).

It would have been obvious to a person of ordinary skill in the art to modify FE1 in view of FE2 and Glowacki to include the first and second excitation coils and the first and second pick-up coils are wound once substantially in a zigzag fashion given the

above disclosure and teaching of Choi and Wong in order to be able to easily manufacture the zigzags to precision by using standard circuit board technology.

As to Claims 21 and 24,

FE1 in view of FE2 and Glowacki discloses as explained above.

FE1 discloses the first and second excitation coils and the first and second pick-up coils face each other with the intervention of the rectangular-ring therebetween ((Figure 1A) and (Column 2, Lines 15-32)).

FE1 in view of FE2 and Glowacki does not disclose the first and second excitation coils and the first and second pick-up coils are wound once substantially in a zigzag fashion.

Choi discloses an excitation in a zigzag fashion (Figure 4).

Wong discloses an advantage of zig-zag meander line patterns is that they can be easily manufactured to precision by machining or etching using standard circuit board technology ((Column 7, Lines 65-67) and (Column 8, Line 1)).

It would have been obvious to a person of ordinary skill in the art to modify FE1 in view of FE2 and Glowacki to include the first and second excitation coils and the first and second pick-up coils are wound once substantially in a zigzag fashion given the above disclosure and teaching of Choi and Wong in order to be able to easily manufacture the zigzags to precision by using standard circuit board technology.

As to Claim 25,

FE1 in view of FE2 and Glowacki does not disclose the first and second excitation coils are wound around both sides of the rectangular-ring in an axial direction alternately substantially in a figure-eight pattern.

Choi discloses winding an excitation coil in a figure-eight pattern (Column 4, Lines 38-55).

It would have been obvious to a person of ordinary skill in the art to modify FE1 in view of FE2 and Glowacki to include the first and second excitation coils are wound around both sides of the rectangular-ring in an axial direction alternately substantially in a figure-eight pattern.given the above disclosure and teaching of Choi in order to have magnetic fluxes generated by alternating excitation currents that are opposite to each other (Column 3, Lines 40-43).

As to Claim 26,

FE1 discloses the first and second pick-up coils have a structure of winding both sides of the rectangular-ring in an axial direction together substantially in a solenoid pattern ((Figures 1A and 1B) and (Column 2, Lines 15-32)).

As to Claim 27,

FE1 discloses the first and second excitation coils and the first and second pick-up coils have a structure of winding the rectangular-ring in an alternating fashion ((Figures 1A and 1B) and (Column 2, Lines 15-32)).

As to Claim 28,

FE1 in view of FE2 and Glowacki discloses as explained above.

FE1 discloses the first and second excitation coils and the first and second pick-

up coils face each other with the intervention of the rectangular-ring therebetween ((Figure 1A) and (Column 2, Lines 15-32)).

FE1 in view of FE2 and Glowacki does not disclose the first and second excitation coils and the first and second pick-up coils are wound once substantially in a zigzag fashion.

Choi discloses an excitation in a zigzag fashion (Figure 4).

Wong discloses an advantage of zig-zag meander line patterns is that they can be easily manufactured to precision by machining or etching using standard circuit board technology ((Column 7, Lines 65-67) and (Column 8, Line 1)).

It would have been obvious to a person of ordinary skill in the art to modify FE1 in view of FE2 and Glowacki to include the first and second excitation coils and the first and second pick-up coils are wound once substantially in a zigzag fashion given the above disclosure and teaching of Choi and Wong in order to be able to easily manufacture the zigzags to precision by using standard circuit board technology.

As to Claim 29,

FE1 discloses the first and second pick-up coils have a structure of winding both sides of the rectangular-ring in an axial direction substantially in a solenoid pattern ((Figures 1A and 1B) and (Column 2, Lines 15-32)).

As to Claim 30,

FE1 discloses the first and second excitation coils and the first and second pick-up coils have a structure of winding the rectangular-ring in an alternating fashion ((Figures 1A and 1B) and (Column 2, Lines 15-32)).

As to Claim 31,

FE1 in view of FE2 and Glowacki discloses as explained above.

FE1 discloses the first and second excitation coils and the first and second pick-up coils face each other with the intervention of the rectangular-ring therebetween ((Figure 1A) and (Column 2, Lines 15-32)).

FE1 in view of FE2 and Glowacki does not disclose the first and second excitation coils and the first and second pick-up coils are wound once substantially in a zigzag fashion.

Choi discloses an excitation in a zigzag fashion (Figure 4).

Wong discloses an advantage of zig-zag meander line patterns is that they can be easily manufactured to precision by machining or etching using standard circuit board technology ((Column 7, Lines 65-67) and (Column 8, Line 1)).

It would have been obvious to a person of ordinary skill in the art to modify FE1 in view of FE2 and Glowacki to include the first and second excitation coils and the first and second pick-up coils are wound once substantially in a zigzag fashion given the above disclosure and teaching of Choi and Wong in order to be able to easily manufacture the zigzags to precision by using standard circuit board technology.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David Schindler whose telephone number is (571) 272-2112. The examiner can normally be reached on M-F (8:00 - 5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Lefkowitz can be reached on (571) 272-2180. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



David Schindler